

Claim

1. A polypeptide which comprises the amino acid sequence described in SEQ ID NO:1 or 5.
2. A polypeptide which comprises an amino acid sequence of the amino acid sequence described in SEQ ID NO:1 or 5, wherein one or several amino acids are deleted, substituted or added and has a nucleoside transporting activity.
3. A DNA which encodes the polypeptide of claim 1 or 2.
4. A DNA which has the nucleotide sequence described in SEQ ID NO:2 or 6.
5. A DNA which hybridizes with the DNA of claim 3 or 4 under stringent conditions and encodes a polypeptide having a nucleoside transporting activity.
6. A recombinant DNA which is obtained by inserting the DNA of any one of claims 3 to 5 into a vector.
7. The recombinant DNA according to claim 6, wherein the recombinant DNA is a plasmid p46-1 or p3-2.
8. A transformant which harbours the recombinant DNA of claim 6 or 7.
9. The transformant according to claim 8, wherein the transformant is a transformant selected from a

microorganism, an animal cell, a plant cell and an insect cell.

10. The transformant according to claim 9, wherein the microorganism is a microorganism belonging to the genus *Escherichia*.

11. The transformant according to claim 10, wherein the microorganism belonging to the genus *Escherichia* is *Escherichia coli* JM109/p46-1 (FERM BP-6462) or *Escherichia coli* JM109/p3-2 (FERM BP-6830).

12. A method for producing the polypeptide of claim 1 or 2, which comprises culturing the transformant of any one of claims 8 to 11 in a medium to form and accumulate the polypeptide of claim 1 or 2 in the culture, and subsequently recovering the polypeptide from the culture.

13. An oligonucleotide which is selected from oligonucleotides having a sequence identical to continuous 5 to 60 bases in a nucleotide sequence of the DNA of any one of claims 3 to 5, an oligonucleotide having a sequence complementary to said oligonucleotide and oligonucleotide derivatives of these oligonucleotides.

14. The oligonucleotide according to claim 13, which is selected from oligonucleotide derivatives in which a phosphodiester linkage in the oligonucleotide is substituted by a phosphorothioate bond, an oligonucleotide derivative in which phosphodiester linkage in the

oligonucleotide is substituted by a N3'-P5' phosphoamidate bond, an oligonucleotide derivative in which a ribose and phosphodiester linkage in the oligonucleotide are substituted by peptide-nucleic acid linkage, an oligonucleotide derivative in which uracil in the oligonucleotide is substituted by C-5 propynyluracil, an oligonucleotide derivative in which uracil in the oligonucleotide is substituted by C-5 thiazoleuracil, an oligonucleotide derivative in which cytosine in the oligonucleotide is substituted by C-5 propynylcytosine, an oligonucleotide derivative in which cytosine in the oligonucleotide is substituted by phenoxazine-modified cytosine, an oligonucleotide derivative in which ribose in the DNA is substituted by 2'-O-propylribose and an oligonucleotide derivative in which ribose in the oligonucleotide is substituted by 2'-methoxyethoxyribose.

15. A method for detecting mRNA encoding the polypeptide of claim 1 or 2 using the oligonucleotide of claim 13 or 14.

16. A method for inhibiting expression of the polypeptide of claim 1 or 2 using the oligonucleotide of claim 13 or 14.

17. An antibody which recognizes the polypeptide of claim 1 or 2.

18. An immunological detection method of the polypeptide of claim 1 or 2 or an immunohistological staining method, which comprises using the antibody of claim 17.

19. An immunohistological staining agent which comprises the antibody of claim 17.

20. A method for screening a compound capable of changing the activity to transport a nucleoside of the polypeptide of Claim 1 or 2, which comprises contacting said polypeptide with a test sample.

21. A compound obtainable by the method of claim 20.

22. A method for screening a compound capable of changing expression of a gene encoding the polypeptide of claim 1 or 2, which comprises contacting a cell expressing said polypeptide with a test sample.

23. The screening method according to claim 22, wherein the detection of changes in the expression of the gene encoding the polypeptide of claim 1 or 2 is carried out by detecting mRNA encoding said polypeptide using the method of claim 15.

24. The screening method according to claim 22, wherein the detection of changes in the expression of the gene encoding the polypeptide of claim 1 or 2 is carried

out by detecting said polypeptide using the method of claim 18.

25. A compound obtainable by any one of the methods of claims 22 to 24.

26. A preventive agent or a therapeutic agent for ischemic heart disease, cerebral disorder at the time of stroke, immune response accompanied by organ transplantation, malignant tumor, nephritis, pancreatitis or hypertension in a mammal, which comprises the polypeptide of claim 1 or 2.

27. An agent for increasing activity of an antiviral agent or a malignant tumor treating agent for mammal, which comprises the polypeptide of claim 1 or 2.

28. An analgesic or an antiplatelet agent for a mammal, which comprises the polypeptide of claim 1 or 2.

29. An agent for reducing side effects at the time of chemotherapy of a mammal, which comprises the polypeptide of claim 1 or 2.

30. A preventive agent or a therapeutic agent for ischemic heart disease, cerebral disorder at the time of stroke, immunoreaction accompanied by organ transplantation, malignant tumor, nephritis, pancreatitis or hypertension in a mammal, which comprises the oligonucleotide of claim 13 or 14.

31. An agent for increasing activity of an antiviral agent or a malignant tumor treating agent for a mammal, which comprises the oligonucleotide of claim 13 or 14.

32. An analgesic or an antiplatelet agent for a mammal, which comprises the oligonucleotide of claim 13 or 14.

33. An agent for reducing side effects at the time of chemotherapy of a mammal, which comprises the oligonucleotide of claim 13 or 14.

34. A preventive agent or a therapeutic agent for ischemic heart disease, cerebral disorder at the time of stroke, immune response accompanied by organ transplantation, malignant tumor, nephritis, pancreatitis or hypertension in a mammal, which comprises the antibody of claim 17.

35. An agent for increasing activity of an antiviral agent or a malignant tumor treating agent for a mammal, which comprises the antibody of claim 17.

36. An analgesic or an antiplatelet agent for a mammal, which comprises the antibody of claim 17.

37. An agent for reducing side effects at the time of chemotherapy of a mammal, which comprises the antibody of claim 17.

38. The preventive agent or a therapeutic agent for ischemic heart disease, cerebral disorder at the time of stroke, immune response accompanied by organ transplantation, malignant tumor, nephritis, pancreatitis or hypertension according to any one of claims 26, 30 and 34, wherein the mammal is human.

39. The agent for increasing activity of an antiviral agent or a malignant tumor treating agent according to any one of claims 27, 31 and 35, wherein the mammal is human.

40. The analgesic or antiplatelet agent according to any one of claims 28, 32 and 36, wherein the mammal is human.

41. The agent for reducing side effects at the time of chemotherapy according to any one of claims 29, 33 and 37, wherein the mammal is human.

42. A promoter DNA which controls transcription of a gene encoding the polypeptide of claim 1 or 2.

43. A method for screening a compound capable of changing efficiency of transcription by the promoter DNA of claim 42, which comprises contacting a transformant harboring a plasmid containing said promoter and a reporter gene connected to the downstream of said promoter DNA with a test sample and measuring the content of translation product of said reporter gene.

44. The screening method according to claim 43, wherein the reporter gene is a gene selected from a chloramphenicol acetyltransferase gene, a β -galactosidase gene, a luciferase gene and a green fluorescent protein gene.

45. A compound obtainable by the method of claim 43 or 44.